

Another Sequence Problem

You are to write a program to perform some operations on a given sequence. These operations are listed below:

Name	Input format	function
Modify	MAKE-SAME i t c	Modify all the t numbers from the ith number(included) to number c.
Insert	INSERT i t s	Insert t numbers after the ith number. s is a sequence of t numbers which should be inserted one-to-one. If i=0, you should insert s in the first of the sequence.
Delete	DELETE i t	Delete t numbers after the ith number(included).
Reverse	REVERSE i t	Reverse t numbers after the ith number(included).
Get sum	GET-SUM i t	Output the sum of t numbers after the ith number(included).
Get maximum partial sum	MAX-SUM	Output the maximum partial sum in the sequence now.

See the example.

Input

The very first line contains a single integer T ($T \leq 4$), the number of test cases. T blocks follow.

For each test case:

The first line contains two integers n and m ($m \leq 20000$), the number of numbers in the sequence in the beginning and the number of operations.

The second line contains n integers separated by spaces, the sequence in the beginning.

Next m lines, each contains an operation listed above.

You can assume that for each test case:

- No invalid operation is in the input.
- Number of numbers in the sequence is no more than 500000 and not less than 1 at any time.
- All the numbers in the sequence is in range $[-1000, 1000]$ at any time.
- The total number of numbers inserted will be not more than 4,000,000. The input is no more than 20MB.

Output

For each Get sum and Get maximum partial sum operation, you should write the answer to the output, one per line.

Example

Input:

```
1
9 8
2 -6 3 5 1 -5 -3 6 3
GET-SUM 5 4
MAX-SUM
INSERT 8 3 -5 7 2
DELETE 12 1
MAKE-SAME 3 3 2
REVERSE 3 6
GET-SUM 5 4
MAX-SUM
```

Output:

```
-1
10
1
10
```

Hints:

After the 3rd op., the sequence is

```
2 -6 3 5 1 -5 -3 6 -5 7 2 3
```

After the 4th op., the sequence is

```
2 -6 3 5 1 -5 -3 6 -5 7 2
```

After the 5th op., the sequence is

```
2 -6 2 2 2 -5 -3 6 -5 7 2
```

After the 6th op., the sequence is

```
2 -6 6 -3 -5 2 2 2 -5 7 2
```

Warning: enormous Input/Output data, be careful with certain languages